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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/748,271	12/31/2003	Do-young Kim	249/430	6611
7590 04/29/2005			EXAMINER	
LEE & STERBA, P.C. SUITE 2000 1101 WILSON BOULEVARD ARLINGTON, VA 22209			NGUYEN, JOSEPH H	
			ART UNIT	PAPER NUMBER
			2815	

DATE MAILED: 04/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/748,271	<b>Applicant(s)</b> KIM ET AL.	
	<b>Examiner</b> Joseph Nguyen	<b>Art Unit</b> 2815	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 24 March 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-66 is/are pending in the application.
- 4a) Of the above claim(s) 20-66 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>3/3/05, 6/21/04</u> | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Election/Restrictions***

Applicant's election of claims 1-19 in the reply filed on 3/24/2005 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 3, 5, 12 and 14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 3 and 12, it is not understood what type of hardness is claimed (i.e. Rockwell hardness, Vickers hardness...) since applicant does not disclose the hardness measuring method is being used. Therefore, it must be corrected to include a type of hardness of the protective cap.

Regarding claims 5 and 14, it is not understood how "the protective cap is formed on an upper surface of the semiconductor chip and *between* the semiconductor chip and the flexible substrate" is obtained since in figure 2 of the instant application, it

appears that the protective cap is formed on an upper surface of the semiconductor chip *but not* between the semiconductor chip and the flexible substrate.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 4-8, 10, 13-17 and 19 are rejected under 35 U.S.C. 102(e) as being anticipated by Koyama (US 2001/0017372 A1).

Regarding claim 1, Koyama discloses on figure 5 a thin film semiconductor comprising a flexible substrate 501 (para [0065], lines 3-5); a semiconductor chip 601 (para [0069], lines 1-3), which is formed on the flexible substrate; and a protective cap 518 (para [0072], lines 4-7), which seals the semiconductor chip.

Note that Koyama teaches that the substrate 501 is a plastic substrate (para [0065], lines 3-5), which is the same material being used to form the *flexible* substrate in the instant application (page 18, lines 2-3 of the instant application). Therefore, the substrate 501 is flexible. Further, the term “protective” is merely a label. Element 518 is considered “protective layer” since it constitutes a similar structure and function as the claimed protective cap.

Regarding claim 4, Koyama discloses on figure 5 the protective cap 518 is formed on an upper surface of the semiconductor device.

Regarding claim 5, as best understood, Koyama discloses on figure 5 the protective cap 518 is formed on an upper surface of the semiconductor chip 601 and between the semiconductor chip 601 and the flexible substrate 501.

Regarding claim 6, Koyama discloses on figure 5 the semiconductor chip 601 is a thin film transistor (para [0069], lines 1-3).

Regarding claim 7, Koyama discloses on figure 5 the protective cap 518 is formed of an ultraviolet curing resin (para [0072], lines 4-7). Applicant discloses that the ultraviolet curing resin is an acrylic resin (para [0026] of the instant application). Koyama teaches that the protective cap is formed of an acrylic resin (para [0072], lines 4-7). Therefore, Koyama teaches the protective cap is an ultraviolet curing resin.

Regarding claim 8, Koyama discloses that the flexible substrate is formed of plastic (para [0065], lines 3-5).

Regarding claim 10, Koyama discloses on figure 5 an electronic device including a flexible substrate 501 and a semiconductor chip 601, the electronic device comprising a protective cap 518 that seals the semiconductor chip.

Regarding claim 13, Koyama discloses on figure 5 the protective cap 518 is formed on an upper surface of the semiconductor chip 601.

Regarding claim 14, as best understood, Koyama discloses on figure 5 the protective cap 518 is formed on an upper surface of the semiconductor chip 601 and between the semiconductor chip 601 and the flexible substrate 501.

Regarding claim 15, Koyama discloses on figure 5 the semiconductor chip 601 is a thin film transistor (para [0069], lines 1-3).

Regarding claim 16, Koyama discloses on figure 5 the protective cap 518 is formed of an ultraviolet curing resin (para [0072], lines 4-7). Applicant discloses that the ultraviolet curing resin is an acrylic resin (para [0026] of the instant application).

Koyama teaches that the protective cap is formed of an acrylic resin (para [0072], lines 4-7). Therefore, Koyama teaches the protective cap is an ultraviolet curing resin.

Regarding claim 17, Koyama discloses that the flexible substrate is formed of plastic (para [0065], lines 3-5).

Regarding claim 19, Koyama discloses on figure 9C further an organic light emitting diode connected to the semiconductor chip (para [0098], [0099]).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koyama.

Regarding claims 2 and 11, the difference between Koyama and the claimed invention is the tensile strength of the protective cap being greater than about 30 GPa.

However, it would have been obvious to one of ordinary skill in the art at the time the

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invention was made to modify Koyama by having the tensile strength of the protective cap being greater than about 30 GPa for the purpose of providing a better protection of a semiconductor device, since it has been held that where the general conditions of a claim are disclosed in the prior art discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

Claims 9 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koyama, and further in view of Yamada et al. (US 2002/0097362 A1)

Regarding claims 9 and 18, the difference between Koyama and the claimed invention is the flexible substrate being a glass substrate having a thickness less than about 100  $\mu\text{m}$ . However, Yamada et al. teaches a glass substrate having thickness being less than about 100  $\mu\text{m}$  (para [0215], lines 4-5). In view of such teaching, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Koyama by having a glass substrate having a thickness less than about 100  $\mu\text{m}$  for the purpose of manufacturing a semiconductor device in a cost effective way since the thinner the substrate, the cheaper it is to form the semiconductor device.

### ***Conclusion***


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph Nguyen whose telephone number is (571) 272-1734. The examiner can normally be reached on Monday-Friday, 7:30 am- 4:30 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's

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supervisor, Tom Thomas can be reached on (571) 272-1664. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306 for regular communications.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JN  
April 26, 2005

  
TOM THOMAS  
SUPERVISORY PATENT EXAMINER